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A Message From Stacy McLaughlin, Division Leader

Welcome to our June 2021 issue of the AMPP newsletter. I hope the information you find within this newsletter allows you, as either a new addition to AMPP or as a long-term AMPP family member, to gain a better understanding of our organization and how we are working to meet not just our mission deliverables of today, but preparing for our future. In this newsletter issue the articles are dedicated to the principle of **how** we do work is as important as **what** we do. AMPP is known for excellence in our NNSA and DOE Missions execution. In this issue we are highlighting our Heat Source Final Assembly (HSFA) manufacturing efforts. Although what we produce for our HSFA customer is important their faith in us as an organization is just as much based on how we perform work to ensure that we safely and securely produce a quality product. We have added a new section to the newsletter called the "Group Leader Corner" where in this issues Chasity Kolar, the Group Leader for AMPP-3, discusses what it means to have a questioning attitude.

Please take the message of how we do work to heart and use it in our daily interactions with co-workers both within AMPP as well as our sister organizations. In addition to all of the great articles in this issue I would encourage you to read through the 2021 Laboratory Agenda whose link is found on the bottom of the LANL homepage. The Laboratory Agenda provides a structured framework that identifies the critical outcomes, strategic initiatives and near-term R&D, and production and mission-support activities needed to accomplish our mission. This document along with our specific customer deliverables guides our AMPP management team in making critical decisions related to organizational structure, staff planning, continuous improvement initiatives, such as Lean Six Sigma highlighted in this newsletter, and requests for support from sister-organizations.

In closing, I want to thank all of you for your diligence and perseverance during these challenging times. It is through your individual and team efforts that we have been so successful. Keep up the great work!

Stacy McLaughlin
AMPP Division Leader



Congrats! LANL Service Anniversaries




35 years
Alan Hoff
AMPP - 1

5 years

· John Ahern	AMPP-4
· Michael Brown	AMPP-1
· Keven Castillo Quintana	AMPP-1
· Barton Lefler	AMPP-1
· Jacob Archuleta	AMPP-1

10 years

· James Aragon	AMPP-3
· Lawrence Aragon	AMPP-1
· Audrey Roman	AMPP-1
· Joey Sanchez	AMPP-1



Group Leader Corner

Having a questioning attitude

Chastity Kolar

I am a lucky Mom to a very curious eight-year-old boy. When he was a toddler and the flood of questions started: “Are we there yet?”; “Why is the sky blue?”; “Why this?”; “Why that?”; “How does this work?”; “How does that work?” etc. There seems to be an endless list of questions from my child especially as he is discovering new things. As a parent, I have made it a point to take the time to answer his questions even if I did not know the answer. Together we would ask Google or Alexa and magically get our answer. On a few occasions, I have caught my child asking Google or Alexa questions on his own. Fortunately, Google and Alexa had my back when it came to Santa Claus, the Easter Bunny and the Tooth Fairy! By always finding the answer, I am making sure that my child knows that he can always come to me and ask me anything especially when the evils of peer pressure starts. As a manager, I want to make sure that I am already preparing my child for whatever career he might choose and instilling in him a questioning attitude.

So, why is it that as we grow older, most people tend to ask fewer questions? This maybe in part that we start to make assumptions about many of the things around us based on what we have already learned or observed. It could also be because maybe someone made us feel ashamed that we did not know the answer. Maybe at one point, someone made it clear that he or she had more important things to do than to respond to your questions. Situations as simple as walking by a broken door day after day without stopping and questioning why it remains broken. Or, it could be something a little more complicated such as not speaking up to question a calculation that does not seem right because a senior engineer performed the calculation. It is important to acknowledge that no one has all the right answers. Maybe Google and Alexa do but they are not human.

Redeveloping that questioning attitude that we had as children is very important to the health and safety culture of an organization. Having a questioning attitude does not

come from a lack of trust for others or a belief that you or fellow workers are ill-prepared to complete the task. It comes from a belief that there may be a better way of doing things and that the best way to manage/mitigate risk is by proactively identifying and addressing them. Having a questioning attitude is not confined just to PF-4 and any physical processes/procedures, it is important in all aspects of our work. A questioning attitude helps to prevent “group think” by encouraging diversity of thought and intellectual curiosity. It challenges the organization to get clarification when something comes up that just does not seem right.

What does a properly motivated questioning attitude look like? It could be as simple as a worker inspecting his or her workspace at the beginning of each day to make sure everything is in place, all equipment settings are correct, and nothing appears to be out of the ordinary. It is noticing certain aspects of your work and asking if there is a better way to do that part of the job. It is trying to anticipate what might go wrong and address it before it does. You need to be able to notice when you are just going along with something out of habit and recognize when a situation needs further questioning. This cannot be done if you are on autopilot or rushing through decisions just to be done with your work. It is equally important to respond positively when workers direct a question to you. People are more likely to ask questions if they feel safe and know that they will be heard and acknowledged without fearing confrontation or punishment. You do not have to accept what they are saying, you just need to seriously consider their point of view with respect. Take the time to respond in way that they will understand and do not be intentionally vague. When you seek to understand other people instead of trying to be right, a shift occurs and you will not believe how powerful it is until you see it for yourself. I challenge each of you to embrace your inner curious child and have a questioning attitude every day at work. And, I challenge each of you to openly consider each other’s viewpoints.

Employee Spotlight: Izabela Kruk

Meet Izabela Kruk, a member of AMPP-4's science and engineering team. Izabela has worked at LANL for just over three years. Her team helps to monitor corrosion progression in DOE-STD-3013 containers used for plutonium storage to refine predictions of lifetime expectancy of the Pu packaging. Prior to her time in AMPP, she was a post-doctoral research assistant in the MPA-11 group. There, she was involved in fabrication of thin films of actinide oxides, probing microstructure of the films, and incipient hydride corrosion with reflectivity methods. Her PhD is in inorganic chemistry from University College London in London, England!

Izabela loves the collaborative environment in her job across research disciplines and organizations, and how the dynamic flow of ideas and knowledge supports global security.



When Izabela's not at work, you can find her hanging out with her Weimaraner puppy, Franklin. She and Franklin have been using their free time to practice trailing and tracking methods to help in searches for missing people.

Izabela's last name is Kruk, which in Polish means "a raven"; an apropos meaning for someone now loving life in the nature of Northern New Mexico!

Welcome new employees!

AMPP - 1

Jeanine Varela
Johnny Millard

AMPP - 3

Andrey Grinevich
Brent Foley
Carlos Lopez-Rodriguez
Christopher Godt
Daniel Ryan
Kevin Grothe

AMPP - 4

Austin Basley
Brian Arko
Donatus Asowata
Dylan Russell
Ericka Flores
Luis Segovia
Matthew Simpson
Rami Batrice
Rob Hilko

HSFA Manufacturing

The Heat Source Technologies (AMPP-1) group performs nearly all of the Pu-238 work at LANL. Major programs within the group include Radioisotope Thermoelectric Generator (RTG) manufacturing for Defense Programs (DP) applications, surveillance of existing DP RTGs, and fuel clad manufacturing for NASA applications.

A RTG uses the decay heat from encapsulated nuclear material to generate electricity. For DP applications, this capsule of nuclear material is referred to as a Heat Source Final Assembly (HSFA). A diagram of the components of a HSFA is shown in Figure 1. Despite the relative simplicity of a HSFA, the manufacture of these components is more challenging than first meets the eye. The complete HSFA is a safety-class nuclear material container. Every aspect of the container design and manufacture is subject to intense scrutiny. The nuclear fuel, encapsulating components, and manufacturing processes must all meet demanding technical specifications. In addition, War Reserve (WR) quality requirements must be followed.

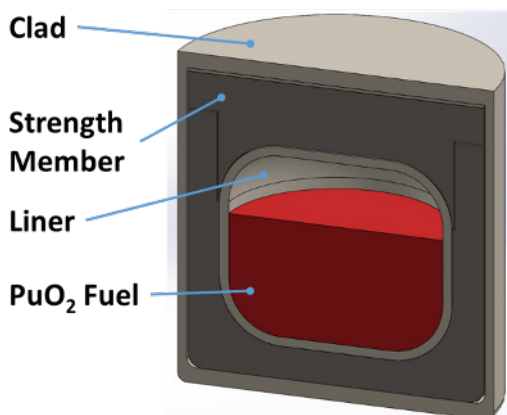


Figure 1: HSFA Assembly Diagram

A flow diagram for HSFA manufacturing is shown in Figure 2. HSFA manufacture starts with harvesting material or retrieving already packaged Heat Source Pu Oxide (HS-PuO₂) material from the vault (this feed method is not shown in Figure 2). Once RTGs for harvest are received they are processed in batches. First, they are de-cased, that is the HSFA is removed from the RTG using a pipe cutter in a hood. Next the HSFA is moved to a glovebox for drilling. A hole is drilled in the HSFA and the HS-PuO₂ is poured out of the HSFA. This material is staged in a temporary storage container, a Fire Rated Transfer

Container (FRTC). Once a harvesting batch is complete, the pooled HS-PuO₂ can be stored in a Fuel Storage Inner (FSI) / Fuel Storage Outer (FSO) container assembly or sent straight to aqueous processing in the FRTC. Following FSI/FSO packaging, the recovered material can be stored in the vault.

The next (often first) step in HSFA manufacturing is aqueous processing of HS-PuO₂ to remove contaminants and increase the percentage of Pu-238 to an acceptable level. Feed for aqueous processing is drawn from materials retrieved from the vault, material already on the process floor, or directly from harvested material. Prior to aqueous processing, a sampling step may be required to determine relevant feed characteristics. Once the feed material is received, dissolution, filtering and heel collection occur. The feed HS-PuO₂ dissolution takes place in a tantalum vessel. The oxide is dissolved in concentrated nitric acid containing a small amount of hydrofluoric acid. After the feed has been dissolving for a long enough time, the solution is filtered and heel (i.e. undissolved feed) is collected. Next, additional chemicals are added to the plutonium nitrate solution to precipitate out Plutonium (III) Oxalate. This oxalate is then filtered out of the mixture. The oxalate cake is calcined in a furnace in an air glovebox to convert the oxalate back to HS-PuO₂ with an acceptable percentage of Pu-238. The HS-PuO₂ product is then sent to fuel processing.

Fuel processing starts with combining and blending fuel from various feed lots (from aqueous). Then, the fuel is ball milled to achieve the desired consistency prior to the slugging and screening operation. Slugging and screening forms the fuel into larger granules (rather than the finer powder of the feed oxide). Next, the first of three samples is collected for analysis. The granules are then loaded into a furnace and high fired. Following high firing, two additional samples are collected for analysis. Finally, the fuel lot is staged for manufacture of the heat source. Once the needed sample analyses are complete, heat source fabrication can commence.

Heat source fabrication starts with loading the fuel lot into charge vials. The amount of fuel loaded in each vial is determined based on the sample analyses performed on that particular fuel lot. Following charge loading, the charges are loaded into liners and welded. After welding, the liners are inspected and then moved to

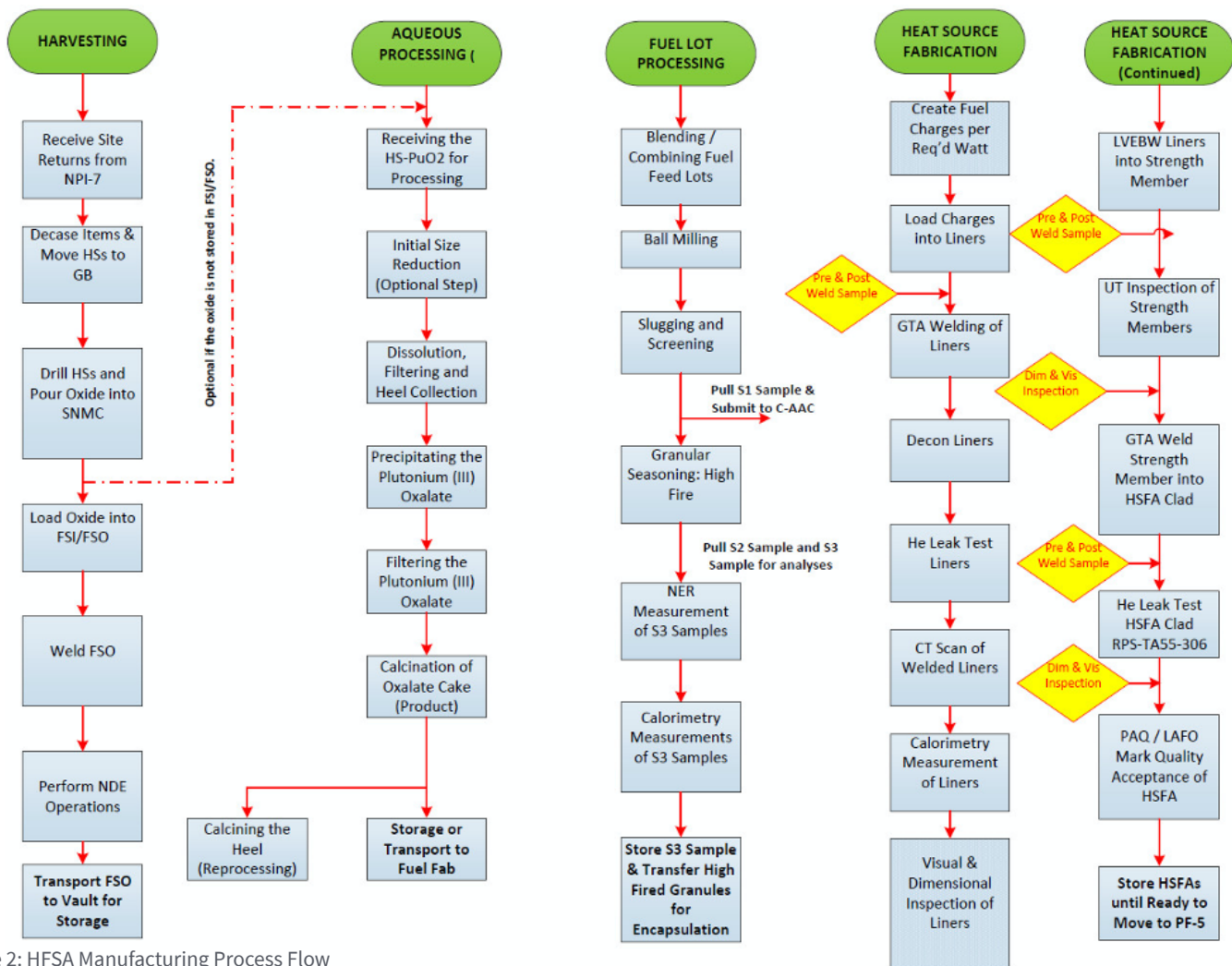


Figure 2: HSFA Manufacturing Process Flow

decontamination. Decontamination is done in a hood by soaking each liner in a series of acid baths and then wiping with cheesecloth to remove all contamination from the exterior of the liner. Once the liner is adequately decontaminated, a final check of the liner surface is performed after 24 hours. If this check is passed, the liner is removed from the glovebox line. All remaining manufacturing steps are performed outside of the glovebox line. Following decontamination, the liner goes through helium leak testing, radiography (Computed Tomography or CT), and calorimetry followed by a thorough visual and dimensional inspection. If the liner passes all of these quality control checks, it is loaded into the strength member layer of the HSFA, which is then welded closed. Next, Ultrasonic Testing (UT) of the strength member is performed. If the strength member passes UT

inspection, it is loaded and welded into a clad. Following clad welding, the complete HSFA is helium leak tested again to ensure integrity of the total HSFA assembly. The final step in HSFA manufacturing is to present all of the manufacturing data to the customer and sell the HSFA. All sold HSFA's are diamond stamped to indicate that they meet WR requirements. Sold HSFA's are assembled into complete RTGs in PF-5. Details of that process will be saved for another time.

As outlined here, HSFA manufacturing includes a number of challenging and exacting operations. Despite the relative simplicity of a HSFA, the fuel processing for and manufacture of these safety-class containers requires painstaking attention to detail and extensive technical expertise. This technical expertise is a hallmark of the AMPP-1 group along with the other LANL organizations that support these efforts.

Lean Six Sigma Green Belt Certification (LSSGB)

AMPP recently sponsored four individuals to receive their LSSGB certification. This is the first of what we hope are many cohorts to undergo this process, or a similar certification process. As part of this certification, the participants are required to attend courses on a weekly basis and participate in a minimum of two Green Belt projects. Some of you may already be aware of the fundamentals of LSS through previous experience, or by being involved in one of our recent projects. For those of you who are not, we want to provide a quick overview what LSS is and some of the key tools used to apply it.

What is Lean Six Sigma?

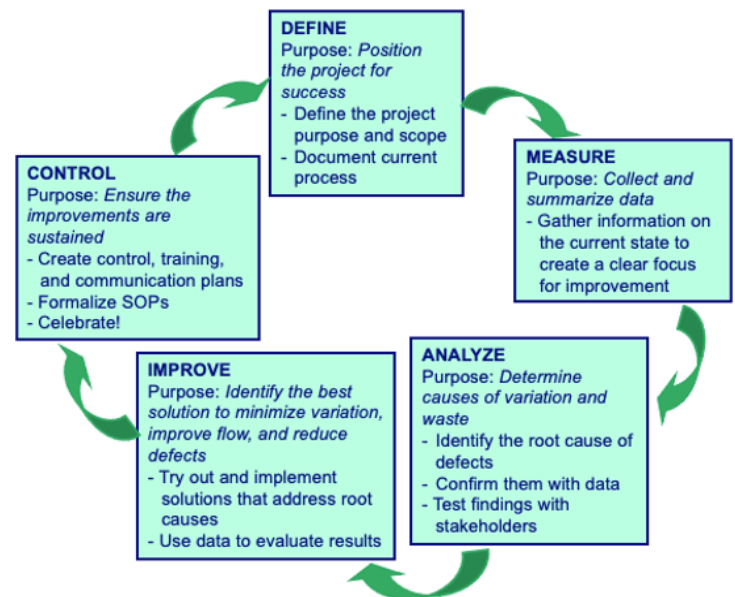
First, we start by breaking the terms apart. Lean, which was discussed in detail in the last newsletter, is aimed at creating efficient process flow. This is done by identifying and removing activities that do not add value (waste). Six Sigma's goal is to improve the quality and effectiveness of a product by decreasing defects and variation. Typically, this is a very data driven process that uses measurement/data collection plans and statistics to aid in process analysis.

While both Lean and Six Sigma methodologies can be applied separately to improve efficiency or increase effectiveness, they are even more successful when working in tandem. Essentially, both methodologies seek to eliminate waste and create a more efficient process, but they have different ways of achieving this goal. LSS uses tools from both methodologies to identify the most effective improvements and implement them.

Lean Six Sigma Tools DMAIC

When leading a LSS project, the Green Belt acts as a facilitator whose job is to establish a team and guide them through the DMAIC process. DMAIC is the acronym for Define, Measure, Analyze, Improve, and Control. It serves as the core tool for driving the project,

and provides a blueprint for the steps that need to be accomplished. The process is cyclical in order to support continuous improvement, by allowing for consecutive improvement projects for an individual process. A team/project is only in one phase of the DMAIC process at a time. This approach ensures that decisions and actions are based on a thorough understanding of the process, instead of opinion or biased data (e.g., you should not develop improvements until you have fully analyzed the data). NOTE: You can move back to previous steps (e.g., during the analyze phase the team realizes it needs some additional/different data so you return to the measure phase).



Voice of the Customer

This tool is used to explore and discover the customer's needs, wants, and expectations. This is accomplished by reviewing technical documents/specifications and holding interviews with stakeholders. The output is some form of table or document, which will aid the team in identifying value added (VA) and non-value added (NVA) activities.

The team works together to create a visual representation of the process, which includes all steps, durations, and inventory. Typically, the VSM will be used to identify VA, NVA, and non-value added but needed (NVAN) steps. VSMs will become very important to the team's decisions during future steps of the DMAIC process. Often, teams make a future state map to depict their post improvement goals. Figure 1 is a VSM completed during a recent AMPP project.



A cause analysis tool often used during brainstorming sessions. It provides the team with a way to sort ideas during their conversation and connect them to categories. Additional follow-up conversations can help the team dive deeper into the causes and potentially create subcategories. Figure 2 is a fishbone diagram completed during a recent AMPP project.

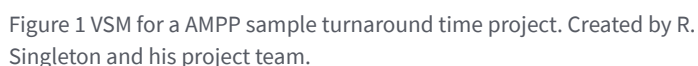


Figure 2 Fishbone for a AMPP downtime variation project. Created by P. Grzeszykowski and his project team.

The above items are just a few of the terms you may hear if you become involved in a LSS project. Other tools you may use include 5s, 5-Whys analysis, payoff matrix, and a PICK chart. More detailed information on these tools can be found online by performing a simple google search, or you are welcome to reach out to Jack Britt with any questions. Finally, another great resource for LSS knowledge is www.gembaacademy.com, which is free to LANL employees (User: lanl Password: lanl).

WESST will also be hosting its second Run/Walk/Crawl on June 17th from 11:00 a.m. to 1:00 p.m. The organization with the most participants will receive the trophy below among other prizes.



We will also have booths, so come learn about LANL resources such as our Medical Response Team, IWESST, ERGO, and Occupational Health along with guest speakers and giveaways at the event!

COVID Restrictions and a Healthy Workplace

Due to the percentage of personnel that are becoming vaccinated at LANL and throughout the United States, a number of changes are occurring. Vaccinated people are able to remove their masks and are no longer required to ensure social distancing. For those that have not received the vaccination, the requirements (mask, 6' of social distancing, etc.) are still in place. There are many reasons why personnel have not or are not able to get vaccinated and we need to ensure a healthy workplace environment by respecting their individual situation regardless of the reason.

Many personnel still choose to wear a mask after vaccination, some choose not to become vaccinated and for others it is due to a medical condition. Please be respectful of your co-workers as we continue to work our way through this pandemic and post-pandemic environment.

Thank You,
Seth Johnson

HOW we do
work is as
important as
WHAT we do

VALUES

COMMITMENT
RESPECT
INTEGRITY
DEALING WITH PROBLEMS
TAKING CARE OF PEOPLE
PRECISION IN LANGUAGE

BEHAVIORS

PERSONAL RESPONSIBILITY
VALUE THE LEGACY
RAISE THE CONCERNS
CONTINUOUS LEARNING
CONTINUOUS IMPROVEMENT